

WHAT IS CLAIMED IS:

- 1 1. A wastewater treatment system comprising:
2 (a) an anaerobic reactor;
3 (b) a first aerobic reactor;
4 (c) a filtration device;
5 (d) a desalinization device;
6 (e) a first conduit connecting the anaerobic reactor to the first aerobic reactor;
7 (f) a second conduit connecting the first aerobic reactor to the filtration
8 device; and
9 (g) a third conduit connecting the filtration device to the desalinization
10 device.
- 1 2. The wastewater treatment system of claim 1, wherein the first aerobic
2 reactor comprises an aeration device.
- 1 3. The wastewater treatment system of claim 1, wherein the second
2 conduit comprises a second aerobic reactor.
- 1 4. The wastewater treatment system of claim 3, wherein the second
2 conduit comprises a valve to direct flow of liquid from the first aerobic reactor to the
3 filtration device; or to direct flow of liquid from the first aerobic reactor to the second aerobic
4 reactor, and then to the filtration device.
- 1 5. The wastewater treatment system of claim 3, wherein the second
2 aerobic reactor comprises an aeration device.
- 1 6. The wastewater treatment system of claim 1, wherein the second
2 conduit further comprises a sludge holding member.
- 1 7. The wastewater treatment system of claim 6, wherein the sludge
2 holding member is a sludge settling tank.
- 1 8. The wastewater treatment system of claim 6, wherein the sludge
2 holding member comprises a sludge dewatering device.

1 9. The wastewater treatment system of claim 8, wherein the sludge
2 dewatering device is selected from the group consisting of a filter press, a screw press, or a
3 belt press.

1 10. The wastewater treatment system of claim 6, wherein the second
2 conduit comprises a second aerobic reactor.

1 11. The wastewater treatment system of claim 10, wherein the second
2 conduit further comprises

3 a) a first liquid conduit, wherein the first liquid conduit connects the first
4 aerobic reactor to the second aerobic reactor or to the filtration device; wherein liquid effluent
5 is transferred from the first aerobic reactor to the second aerobic reactor or to the filtration
6 device; and

7 b). a first sludge conduit wherein the first sludge conduit connects the first
8 aerobic reactor to the sludge holding member.

1 12. The wastewater treatment system of claim 11, further comprising a
2 second liquid conduit, wherein the second liquid conduit connects the sludge holding member
3 and the first liquid conduit.

1 13. The wastewater treatment system of claim 11, further comprising a
2 second sludge conduit, wherein the second sludge conduit connects the second aerobic
3 reactor and the sludge holding member.

1 14. The wastewater treatment system of claim 10, wherein the sludge
2 holding member comprises a sludge dewatering device.

1 15. The wastewater treatment system of claim 14, wherein the sludge
2 dewatering device is selected from the group consisting of a filter press, a screw press, or a
3 belt press.

1 16. The wastewater treatment system of claim 1, wherein the anaerobic
2 reactor is an Anaerobic Biofilm Sequencing Batch Reactor (ABSBR).

1 17. The wastewater treatment system of claim 1, wherein the anaerobic
2 reactor is an Anaerobic Sequencing Batch Reactor (ASBR).

1 18. The wastewater treatment system of claim 1, wherein the anaerobic
2 reactor comprises an anaerobic reactor gas outlet, wherein methane gas is captured from the
3 anaerobic reactor gas outlet.

1 19. The wastewater treatment system of claim 1, wherein the filtration
2 device is selected from the group consisting of a sand filter, a microfilter, a belt filter, a
3 pressure filter, a vacuum filter, an activated charcoal filter, and biomass filter.

1 20. The wastewater treatment system of claim 1, wherein the
2 desalinization device is selected from the group consisting of reverse osmosis membrane
3 separation units, ultrafiltration units, activated carbon filters, and ion exchange resins.

1 21. The wastewater treatment system of claim 1, wherein the
2 desalinization device is a reverse osmosis membrane separation units.

1 22. The wastewater treatment system of claim 21, wherein the reverse
2 osmosis membrane separation unit comprises a reverse osmosis membrane separation unit
3 permeate outlet, and a reverse osmosis membrane separation unit concentrate outlet.

1 23. The wastewater treatment system of claim 1, wherein the wastewater
2 comprises food waste products.

1 24. The wastewater treatment system of claim 1, wherein the wastewater
2 comprises animal waste products.

1 25. The wastewater treatment system of claim 1, wherein the wastewater
2 comprises biological fermentation wastes.

1 26. A method of treating wastewater, the method comprising the steps of
2 (a) treating for a first period, a first mixture comprising wastewater under
3 anaerobic conditions in an anaerobic reactor to form an anaerobic reactor effluent;

4 (b) treating for a second period, the anaerobic reactor effluent under aerobic
5 conditions in a first aerobic reactor to form a first aerobic reactor effluent;

6 (c) passing the first aerobic reactor effluent through a filtration device to form
7 a filtration device effluent; and

8 (d) passing the filtration device effluent through a desalinization device to
9 form a desalinization device effluent.

1 27. The method of claim 26, further comprising the step of incubating the
2 first aerobic reactor effluent for a third period in a second aerobic reactor to form a second
3 aerobic reactor effluent; and passing the second aerobic reactor effluent through the filtration
4 device.

1 28. The method of claim 26, further comprising the step of removing
2 sludge by collecting sludge in a sludge holding tank.

1 29. The method of claim 26, further comprising the step of removing
2 sludge using a sludge dewatering device.

1 30. The method of claim 26, wherein the wastewater comprises food waste
2 products.

1 31. The method of claim 26, wherein the wastewater comprises animal
2 waste products.

1 32. The method of claim 26, wherein the wastewater comprises biological
2 fermentation wastes.

1 33. The method of claim 26, wherein the anaerobic reactor is an Anaerobic
2 Biofilm Sequencing Batch Reactor (ABSBR).

1 34. The method of claim 26, wherein the anaerobic reactor is an Anaerobic
2 Sequencing Batch Reactor (ASBR).

1 35. The method of claim 26, wherein the anaerobic reactor comprises an
2 anaerobic reactor gas outlet and methane gas is captured from the anaerobic reactor gas
3 outlet.

1 36. The method of claim 26, wherein the filtration device is selected from
2 the group consisting of a sand filter, a microfilter, a belt filter, a pressure filter, a vacuum
3 filter, an activated charcoal filter, and biomass filter.

1 37. The method of claim 26, wherein the desalinization device is selected
2 from the group consisting of a reverse osmosis membrane separation unit, an ultrafiltration
3 unit, an activated carbon filter, and an ion exchange resin.

1 38. The method of claim 26, wherein the desalinization device is a reverse
2 osmosis membrane separation unit.

1 39. The method of claim 38, further comprising the step of passing the
2 filtration device effluent through the reverse osmosis separation unit to form a reverse
3 osmosis concentrate and a reverse osmosis permeate, wherein the reverse osmosis permeate
4 is reclaimed water, and the reverse osmosis permeate is concentrated liquid fertilizer.

1 40. The method of claim 26, further comprising the step of adding
2 flocculent chemicals.